

Appl. No. 10/617,679
Amendment dated: November 22, 2004
Reply to OA of: August 23, 2004

REMARKS

Applicants have amended the claims to more particularly define the invention taking into consideration the outstanding Official Action. Applicants most respectfully submit that all the claims now present in the application are in full compliance with 35 U.S.C. §112 and are clearly patentable over the references of record.

The rejection of claims 4-8 under 35 U.S. C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention has been carefully considered but is most respectfully traversed in view of the clarifying amendments to these claims as fully supported by Applicants specification as originally filed.

Claims 4, 6 and 7 have been amended as required by the Examiner in the Official Action to correct the grammatical and idiomatic errors and to conform to current U.S. practice and the amendments are fully supported by the specification as would be appreciated by one of ordinary skill in the art to which the invention pertains. Accordingly, it is most respectfully requested that this rejection be withdrawn.

The rejection of claims 1-8 under 35 U.S.C. §102(b) as being anticipated by Maury et al. has been carefully considered but is most respectfully traversed.

The Examiner urges that Maury et al. discloses all of the limitations of claim 1 and regarding claims 2-8 (as best understood), meets the limitations, e.g., cuprous oxide; pad (160); transversal waves.

Applicant wishes to direct the Examiner's attention to MPEP § 2131 which states that to anticipate a claim, the reference must teach every element of the claim.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*,

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868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed.Cir. 1990).

Maury et al. teaches a polishing head and an ultrasonic sensor mounted on the polishing head, for ultrasonically conducting the end point detection of the CMP process, treating the ultrasonic wave as a sensor for end point detection of the polishing, merely clarifying the first and second ultrasonic vibrations. Thus, Maury et al. is apparently different from the presently claimed invention in method and steps. Further, the presently claimed invention includes a step of treating the copper layer chemically to produce a surface residue layer, but Maury et al. did not. In this regard it noted that the Examiner specifically refers to column 5 of the reference.

However, this portion of the patent teaches that the conductive material 260 is removed by a combination of chemical, i.e., etching, and physical, i.e., mechanical abrasion, processes. The wafer carrier 110 and the semiconductor wafer 120 are pressed onto the slurry 310 on the revolving platen 160, typically at pressures of approximately 6 to 8 psi, the oxidizing components of the slurry 310 oxidizes the conductive material 260 to form a thin layer of metal oxide. This metal oxide is then readily removed by the slurry's abrasive component. As each layer of metal oxide is removed, a new layer is form by the chemical action of the oxidizer in the slurry 310. On the contrary, the ultrasonic polishing of the first treated layer with extremely little force is achieved as noted at page 5 of Applicants' specification. Accordingly, it is most respectfully requested that this rejection be withdrawn.

The rejection of claims 1-8 as best understood under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103 as obvious over Symersky in view of Sato has been carefully considered but is most respectfully traversed.

Applicants wish to direct the Examiner's attention to the basic requirements of a prima facie case of obviousness as set forth in the MPEP § 2143. This section states that to establish a prima facie case of obviousness, three basic criteria first must be

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met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Section 2143.03 states that all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Applicants also most respectfully direct the Examiner's attention to MPEP § 2144.08 (page 2100-114) wherein it is stated that Office personnel should consider all rebuttal argument and evidence present by applicant and the citation of In re Soni for error in not considering evidence presented in the specification.

The '467 reference taught a method (etching and deposit) of manufacturing the metallic conductors of semiconductor, being essentially different from the presently claimed invention disclosing a method (planarization) of removing a metal layer. The '467 patent belongs to the rudimentary method of manufacturing the conductors of semiconductor, but the presently claimed invention does not involve manufacturing the conductors. Since the polishing method of extremely low stress according to the present invention is basically the planarization process of the conductors, which must be conducted after finishing manufacture of the conductors for copper interconnect inlaid process, such as Damascene Process patented by IBM, what the present invention is to be patented is the process of polishing or planarization. Thus, treating the metal and barrier layers chemically to produce the surface residue layer in the polishing method

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of extremely low stress of the present invention to facilitate conducting the mechanical polishing or planarization is apparently different from the method of chemically etching patterns or the current plasma dry etching method of the cited '467 patent. Moreover, the polishing method of the extremely low stress of the presently claimed invention will not be easily inferred by a person having ordinary skill in the art by the cited '467 patent incorporating the ultrasonic wave.

The Sato reference discloses the common CMP art other than the CMP art with respect to the LOW K material and teaches nothing about the steps B and C of the presently claimed invention, therefore being much different from the present invention. Accordingly, it is most respectfully requested that this rejection be withdrawn.

In view of the above comments and further amendments to the claims, favorable reconsideration and allowance of all of the claims now present in the application are most respectfully requested.

Respectfully submitted,

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